CAST-IN-PLACE GRAVITY RETAINING WALLS (9-21-10)

1.0 GENERAL

A cast-in-place (CIP) gravity retaining wall consists of CIP unreinforced concrete and is typically constructed in accordance with the standard CIP gravity retaining wall drawing (Standard Drawing No. 453.01). Construct CIP gravity retaining walls based on actual elevations and dimensions in accordance with the contract and accepted construction submittal. For this provision, "CIP gravity wall" refers to a CIP gravity retaining wall.

2.0 MATERIALS

Refer to Division 10 of the *Standard Specifications*:

Item	Section
Portland Cement Concrete, Class A	1000
Select Material, Class V	1016
Curing Agents for Concrete	1026
Joint Materials	1028
Reinforcing Steel	1070
Masonry	1040
Subdrain Fine Aggregate	1044-1

Use Class V Select Material (standard size no. 78M stone) and subdrain fine aggregate for subsurface drainage at weep holes.

3.0 CONSTRUCTION SUBMITTAL

The plans typically show a plan view, typical sections, details, notes and an elevation or profile view (wall envelope) for each CIP gravity wall. Before beginning CIP gravity wall construction, survey existing ground elevations at the wall face and other elevations in the vicinity of CIP gravity walls as needed. Based on these elevations, finished grades and actual CIP gravity wall dimensions and details, submit wall envelopes for review and acceptance. Use the accepted wall envelopes for construction.

4.0 CONSTRUCTION METHODS

Control drainage during construction in the vicinity of CIP gravity walls. Direct run off away from CIP gravity walls and backfill. Contain and maintain backfill and protect material from erosion.

Perform all necessary clearing and grubbing in accordance with Section 200 of the *Standard Specifications*. Excavate as necessary for CIP gravity walls in accordance with the plans and accepted construction submittal. Embed bottom of footings a minimum of 2 ft (0.6 m) below bottom of walls unless required otherwise on the plans. If applicable and at the Contractor's option, "temporary shoring for wall construction" may be used in lieu of temporary slopes to construct CIP gravity walls. Temporary shoring for wall construction

is defined as temporary shoring not shown on the plans or required by the Engineer including shoring for OSHA reasons or the Contractor's convenience.

Notify the Engineer when foundation excavation is complete. Do not place concrete until obtaining approval of the excavation depth and foundation material.

Construct CIP gravity walls at elevations shown in the accepted construction submittal and in accordance with the plans and Section 420 of the *Standard Specifications*. Extend top of walls 6" (150 mm) above grade elevations unless required otherwise on the plans.

Construct joints at a maximum spacing of 30 ft (9 m) unless required otherwise on the plans. Half-inch (13 mm) thick expansion joints in accordance with Article 420-10 of the *Standard Specifications* are required every third joint. Half-inch (13 mm) deep grooved contraction joints in accordance with Subarticle 825-10(B) of the *Standard Specifications* are required for the remaining joints.

Construct 3" (75 mm) diameter weep holes on 10 ft (3 m) centers along CIP gravity walls. Provide subsurface drainage at weep holes in accordance with Article 410-9 of the *Standard Specifications*. Exit weep holes just above finished grade and slope holes at 1" per foot (25 mm per 0.3 m) through walls so water drains out of the front of CIP gravity walls. If applicable, extend weep holes through concrete barriers in front of CIP gravity walls at the same slope.

Do not remove forms until concrete achieves a minimum compressive strength of 2400 psi (16.5 MPa). Unless required otherwise on the plans, provide a Class 2 Surface Finish for exposed faces of CIP gravity walls in accordance with Article 420-17 of the *Standard Specifications*.

If a brick veneer is required as shown on the plans, construct brick masonry in accordance with Section 830 of the *Standard Specifications*. Anchor brick veneers to CIP gravity walls with approved brick to concrete type anchors according to the manufacturer's specifications with a minimum vertical spacing of 16" (400 mm) and a minimum horizontal spacing of 32" (800 mm) with each row staggered 16" (400 mm) from the row of anchors above and below.

Seal joints above and behind CIP gravity walls between walls and ditches with joint sealer.

5.0 MEASUREMENT AND PAYMENT

CIP Gravity Retaining Walls will be measured and paid for in square feet (meters). CIP gravity walls will be measured as the exposed face area with the wall height equal to the difference between the top and bottom of wall elevation. The top of wall elevation is defined as the top of concrete for CIP gravity walls. The bottom of wall elevation is as shown on the plans and no payment will be made for portions of CIP gravity walls below bottom of wall elevations.

The contract unit price for *CIP Gravity Retaining Walls* will be full compensation for providing submittals, labor, tools, equipment and CIP gravity walls materials, excavating,

backfilling, hauling and removing excavated materials and providing concrete, subsurface drainage at weep holes and any incidentals necessary to construct CIP gravity walls in accordance with the provision. If necessary, the contract unit price for *CIP Gravity Retaining Walls* will also be full compensation for providing brick veneers in accordance with the contract.

No separate payment will be made for temporary shoring for wall construction. Temporary shoring for wall construction will be considered incidental to the contract unit price for *CIP Gravity Retaining Walls*.

The contract unit price for *CIP Gravity Retaining Walls* does not include the cost for fences, handrails, ditches, guardrail and barriers associated with CIP gravity walls as payment for these items will be made elsewhere in the contract.

Payment will be made under:

Pay Item	**Pay Unit**
CIP Gravity Retaining Walls	Square Foot (Meter)